In the claims

Cancel claims 19-40.

Amend claims 1-18 where indicated.

1. (Currently Amended) A magnetic head assembly, which has an air bearing surface (ABS), comprising:

a spin valve sensor, nonmagnetic first and second read gap layers, [[a]] ferromagnetic first and second shield ~~layer and a ferromagnetic first pole piece layer;~~ layers;

the spin valve sensor being located between the first and second read gap layers and the first and second read gap layers being located between the first and second shield ~~layer and the first pole piece layer;~~ layers;

the spin valve sensor having a pinned layer which has a magnetic moment that is pinned by a pinning layer in a direction perpendicular to the ABS;

[[a]] ferromagnetic first and second pole piece [[layer]] layers and a nonmagnetic write gap layer wherein the second pole piece layer is separated from the first pole piece layer by the write gap layer at the ABS and is connected to the first pole piece layer at a back gap;

each of the first and second shield [[layer]] layers and the first and second pole piece layers having a magnetic easy axis that is directed parallel to the ABS;

an insulation stack with a coil layer embedded therein located between the first and second pole piece layers wherein the insulation stack includes at least one baked photoresist insulation layer that has been formed in part by heating at a preselected annealing temperature in the presence of a magnetic field that is directed perpendicular to said ABS;

the insulation stack having been formed subsequent to said sensor and at least the first pole piece layer and/or second shield layer having not been subjected to annealing in the presence of a magnetic field directed parallel to said ABS before said heating of the layer of the insulation stack; and

at least one of the first and second shield layers and the first and second pole piece layers comprising NiFeCo-O-N or NiFeCo-N.

2. (Original) A magnetic head assembly as described in claim 1 wherein the second shield layer and the first pole piece layer are a common layer.

3. (Original) A magnetic head assembly as described in claim 1 wherein the second shield layer and the first pole piece layer are separate layers and are separated by a nonmagnetic insulative isolation layer.

4. (Original) A magnetic head assembly as described in claim 1 wherein the second shield layer comprises NiFeCo-N.

5. (Original) A magnetic head assembly as described in claim 1 wherein the second pole piece layer comprises a laminated layer of NiFeCo-O-N films with interlayer films of Al_2O_3 or SiO_2.

6. (Original) A magnetic head assembly as described in claim 5 including:
a seed layer comprising NiFeCo-O-N;
the second pole piece layer being directly on the seed layer; and
the seed layer having higher O and N contents than the NiFeCo-O-N of the second pole piece layer.

7. (Original) A magnetic head assembly as described in claim 6 including:
a bottom layer of SiO_2; and
the seed layer being located between the bottom layer and the second shield layer.

8. (Original) A magnetic head assembly as described in claim 7 wherein the laminated layer includes four NiFeCo-O-N films that are each substantially 4500 Å thick.

9. (Original) A magnetic head assembly as described in claim 8 wherein the second shield layer comprises NiFeCo-N.

10. (Currently Amended) A magnetic disk drive including a magnetic head assembly having an air bearing surface (ABS), the disk drive comprising:

the magnetic head assembly including:

a spin valve sensor, first and second nonmagnetic first and second read gap layers, [[a]] ferromagnetic first and second shield ~~layer and a ferromagnetic first pole piece layer;~~ layers;

the spin valve sensor being located between the first and second read gap layers and the first and second read gap layers being located between the first and second shield ~~layer and the first pole piece layer;~~ layers;

the spin valve sensor having a pinned layer which has a magnetic moment that is pinned by a pinning layer in a direction perpendicular to the ABS;

[[a]] ferromagnetic first and second pole piece [[layer]] layers and a write gap layer wherein the second pole piece layer is separated from the first pole piece layer by the write gap layer at the ABS and is connected to the first pole piece layer at a back gap;

each of the first and second shield [[layer]] layers and the first and second pole piece layers having an easy axis that is directed parallel to the ABS;

an insulation stack with a coil layer embedded therein located between the first and second pole piece layers wherein the insulation stack includes at least one baked photoresist insulation layer that has been formed in part by heating at a preselected annealing temperature in the presence of a magnetic field that is directed perpendicular to said ABS; and

the insulation stack having been formed subsequent to said sensor and at least the first pole piece layer and/or second shield layer having not been subjected to annealing in the presence of a magnetic field directed parallel to the ABS before said heating of the layer of the insulation stack; and

at least one of the first and second shield layers and the first and second pole piece layers comprising NiFeCo-O-N or NiFeCo-N;

a housing;

a magnetic disk rotatably supported in the housing;

a support mounted in the housing for supporting the magnetic head with its ABS site facing the magnetic disk so that the magnetic head is in a transducing relationship with the magnetic disk;

spindle motor for rotating the magnetic disk;

an actuator means connected to the support for moving the magnetic head to multiple positions with respect to said magnetic disk; and

a processor connected to the magnetic head, to the spindle motor and to the actuator for exchanging signals with the magnetic head, for controlling movement of the magnetic disk and for controlling the position of the magnetic head.

11. (Original) A magnetic disk drive as described in claim 10 wherein the second shield layer and the first pole piece layer are a common layer.

12. (Original) A magnetic disk drive as described in claim 10 wherein the second shield layer and the first pole piece layer are separate layers and are separated by a nonmagnetic insulative isolation layer.

13. (Original) A magnetic disk drive as described in claim 10 wherein the second shield layer comprises NiFeCo-N.

14. (Original) A magnetic disk drive as described in claim 10 wherein the second pole piece layer comprises a laminated layer of NiFeCo-O-N films with interlayer films of Al_2O_3 or SiO_2.

15. (Original) A magnetic disk drive as described in claim 14 including:

a seed layer comprising NiFeCo-O-N;

the second pole piece layer being directly on the seed layer; and

the seed layer having higher O_2 and N_2 contents than the NiFeCo-O-N of the second pole piece layer.

16. (Original) A magnetic disk drive as described in claim 15 including:

a bottom layer of SiO_2; and

the seed layer being located between the bottom layer and the second shield layer.

17. (Original) A magnetic disk drive as described in claim 16 wherein the laminated layer includes four NiFeCo-O-N films that are each substantially 4500 Å thick.

18. (Original) A magnetic disk drive as described in claim 17 wherein the second shield layer comprises NiFeCo-N.

19.-40. (Canceled)

Add new claims 41-52.

41. (New) A magnetic head assembly, which has an air bearing surface (ABS), comprising:

a spin valve sensor, nonmagnetic first and second read gap layers, a ferromagnetic first shield layer and a ferromagnetic first pole piece layer;

the spin valve sensor being located between the first and second read gap layers and the first and second read gap layers being located between the first shield layer and the first pole piece layer;

the spin valve sensor having a pinned layer which has a magnetic moment that is pinned by a pinning layer in a direction perpendicular to the ABS;

a ferromagnetic second pole piece layer and a nonmagnetic write gap layer wherein the second pole piece layer is separated from the first pole piece layer by the write gap layer at the ABS and is connected to the first pole piece layer at a back gap;

each of the first shield layer and the first and second pole piece layers having a magnetic easy axis that is directed parallel to the ABS and to a greatest thin film surface of multiple thin film surfaces of each respective layer so as to have in-plane anisotropy;

an insulation stack with a coil layer embedded therein located between the first and second pole piece layers wherein the insulation stack includes at least one baked photoresist insulation layer; and

at least one of the first shield layer and the first and second pole piece layers comprising NiFeCo-O-N or NiFeCo-N and having an in-plane uniaxial anisotropy field H_K from 2.6 Oe to 6.0 Oe.

42. (New) A magnetic head assembly as described in claim 41 wherein the second shield layer comprises NiFeCo-N.

43. (New) A magnetic head assembly as described in claim 41 wherein the second pole piece layer comprises a laminated layer of NiFeCo-O-N films with interlayer films of Al_2O_3 or SiO_2.

44. (New) A magnetic head assembly as described in claim 43 including:

a seed layer comprising NiFeCo-O-N;

the second pole piece layer being directly on the seed layer; and

the seed layer having higher O and N contents than the NiFeCo-O-N of the second pole piece layer.

45. (New) A magnetic head assembly as described in claim 44 including:

a bottom layer of SiO_2; and

the seed layer being located between the bottom layer and the second shield layer.

46. (New) A magnetic head assembly as described in claim 45 wherein the laminated layer includes four NiFeCo-O-N films that are each substantially 4500Å thick.

47. (New) A magnetic disk drive including a magnetic head assembly having an air bearing surface (ABS), the disk drive comprising:

the magnetic head assembly including:

a spin valve sensor, first and second nonmagnetic first and second read gap layers, a ferromagnetic first shield layer and a ferromagnetic first pole piece layer;

the spin valve sensor being located between the first and second read gap layers and the first and second read gap layers being located between the first shield layer and the first pole piece layer;

the spin valve sensor having a pinned layer which has a magnetic moment that is pinned by a pinning layer in a direction perpendicular to the ABS;

a ferromagnetic second pole piece layer and a write gap layer wherein the second pole piece layer is separated from the first pole piece layer by the write gap layer at the ABS and is connected to the first pole piece layer at a back gap;

each of the first shield layer and the first and second pole piece layers having an easy axis that is directed parallel to the ABS and to a greatest thin film surface of multiple thin film surfaces of each respective layer so as to have in-plane anisotropy;

an insulation stack with a coil layer embedded therein located between the first and second pole piece layers wherein the insulation stack includes at least one baked photoresist insulation layer; and

at least one of the first shield layer and the first and second pole piece layers comprising NiFeCo-O-N or NiFeCo-N and having an in-plane uniaxial anisotropy field H_K from 2.6 Oe to 6.0 Oe;

a housing;

a magnetic disk rotatably supported in the housing;

a support mounted in the housing for supporting the magnetic head with its ABS site facing the magnetic disk so that the magnetic head is in a transducing relationship with the magnetic disk;

spindle motor for rotating the magnetic disk;

an actuator means connected to the support for moving the magnetic head to multiple positions with respect to said magnetic disk; and

a processor connected to the magnetic head, to the spindle motor and to the actuator for exchanging signals with the magnetic head, for controlling movement of the magnetic disk and for controlling the position of the magnetic head.

48. (New) A magnetic disk drive as described in claim 47 wherein the second shield layer comprises NiFeCo-N.

49. (New) A magnetic disk drive as described in claim 47 wherein the second pole piece layer comprises a laminated layer of NiFeCo-O-N films with interlayer films of Al_2O_3 or SiO_2.

50. (New) A magnetic disk drive as described in claim 49 including:

a seed layer comprising NiFeCo-O-N;

the second pole piece layer being directly on the seed layer; and

the seed layer having higher O_2 and N_2 contents than the NiFeCo-O-N of the second pole piece layer.

51. (New) A magnetic disk drive as described in claim 50 including:

a bottom layer of SiO_2; and

the seed layer being located between the bottom layer and the second shield layer.

52. (New) A magnetic disk drive as described in claim 51 wherein the laminated layer includes four NiFeCo-O-N films that are each substantially 4500Å thick.